Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for multi-band, bidirectional data communication over a non-ideal channel using a single CAP/QAM carrier per band, comprising:

defining an adjustable center frequency and constellation size for each of said multiple bands;

defining a total target bit rate for said multiple bands;

defining a margin requirement for each of said multiple bands;

evaluating a response characteristic of each of said multiple bands; and

varying the adjustable center frequency and constellation size for defining a combination of ~~spectral allocation~~ an optimum center frequency and an optimum constellation size at which bit rate and/or margin is enhanced in accordance with said response characteristic.

2. (Original) The method of claim 1 further comprising the steps of defining a plurality of spectral allocations for each of said multiple bands wherein said response characteristic is evaluated with respect to said plurality of spectral allocations.

3. (Original) The method of claim 2 further comprising the step of determining a maximum constellation size for each of said plurality of spectral allocations in accordance with said response characteristic.

4. (Original) The method of claim 3 further comprising the step of varying said maximum constellation size to increase a signal-noise-ratio margin without falling below a total target bit rate for said multiple bands.

5. (Currently Amended) A method for multi-band, bidirectional data communication over a non-ideal channel using a single CAP/QAM carrier per band, comprising:

evaluating a response characteristic of each of said multiple bands with respect to a parametric set;

varying said parametric set by varying a constellation vector <u>including an adjustable center frequency and an adjustable constellation size</u> to increase a signal-noise-ratio margin without falling below a total target bit rate for said multiple bands;

re-evaluating the response characteristic of each of the multiple bands with respect to said varied parametric set; and

defining an optimal parametric set for which the response characteristic allows optimization of at least one of said constellation vector and signal-noise-ratio margin.

6. (Currently Amended) The method according to claim 5, wherein the step of varying the constellation ~~size~~ vector further comprises:

varying the constellation ~~size~~ vector while maintaining a substantially constant spectral allocation; and

repeating the constellation ~~size~~ vector varying step at a plurality of different discrete spectral allocations.

7. (Original) The method according to claim 5, wherein the step of evaluating a response characteristic of each of said multiple bands with respect to a parametric set comprises evaluating signal-to-noise-ratio.

8. (Original) The method according to claim 5 further comprising the step of evaluating said response characteristic with respect to said optimal parametric set.

9. (Original) The method according to claim 8 further comprising the step of commencing bidirectional communication with said optimal parametric set if said response characteristic complies with a predetermined threshold.

10. (Original) The method according to claim 8 further comprising the step of adjusting said constellation vector in accordance with said response characteristic.

11. (Currently Amended) A method for multi-band, bidirectional data communication over a non-ideal transmission channel using a single CAP/QAM carrier per band, comprising:

defining ~~a spectral allocation~~ an adjustable center frequency for each of said multiple bands;

evaluating a response characteristic of each of said multiple bands with respect to said ~~plurality of spectral allocations~~ adjustable center frequencies;

determining a maximum constellation size for each of said ~~plurality of spectral allocations~~ adjustable center frequencies in accordance with said response characteristic;

determining total bit rate delivered for each of said ~~plurality of spectral allocations~~ adjustable center frequencies and maximum constellation sizes;

varying said maximum constellation sizes to increase signal-noise-ratio margin without falling below a total target bit rate; and

defining an optimal ~~spectral allocation~~ center frequency and constellation size in accordance with at least one of said constellation size and signal-noise-ratio margin.

12. (Currently Amended) A method for multi-band, bidirectional data communication over a non-ideal transmission channel using a single CAP/QAM carrier per band, comprising:

defining ~~a plurality of spectral allocations~~ an adjustable center frequency for each of said multiple bands;

evaluating a response characteristic of each of said multiple bands with respect to said ~~plurality of spectral allocations~~ adjustable center frequency;

determining a maximum constellation size for said adjustable center frequency of each of said ~~plurality of spectral allocations~~ multiple bands in accordance with said response characteristic;

determining total bit rate delivered for each of said ~~plurality of spectral allocations~~ adjustable center frequencies and maximum constellation sizes; and

defining an optimal ~~spectral allocation~~ center frequency and constellation size at which bit rate and/or noise margin is enhanced in accordance with said total bit rate.

13. (Currently Amended) The method according to claim 12 wherein the step of defining an optimal ~~spectral allocation~~ center frequency and constellation size comprises:

defining a first subset containing ~~spectral allocation~~ center frequency and constellation size combinations for which the total bit rate is equal to or greater than a target bit rate;

varying said plurality of ~~constellation sizes~~ center frequencies within said first subset to increase said noise margin without falling below a total target bit rate for said multiple bands; and

defining said optimum ~~constellation sizes~~ center frequency and constellation size in accordance with said increased noise margin.

14. (Currently Amended) The method according to claim 13 wherein the step of defining said optimum ~~constellation sizes~~ center frequency and constellation size in accordance with said increased noise margin comprises defining optimum ~~constellation sizes~~ center frequency and constellation size in accordance with largest minimum noise margin.

15. (Currently Amended) The method according to claim 12 wherein the step of defining an optimal ~~constellation sizes~~ center frequency and constellation size comprises:

defining a first subset containing ~~constellation sizes~~ center frequency and constellation size combinations that provide a total bit rate that is less than a target bit rate;

identifying ~~constellation sizes~~ center frequency and constellation size combinations within said first subset that provide largest total bit rate; and

defining said optimum ~~constellation sizes~~ center frequency and constellation size in accordance with said noise margin.

16. (Currently Amended) The method according to claim 12 wherein the step of defining an optimal ~~constellation sizes~~ center frequency and constellation size comprises:

defining a first subset containing ~~constellation sizes~~ center frequency and constellation size combinations for which the total bit rate is equal to or greater than a target bit rate;

varying said ~~plurality of constellation sizes~~ center frequencies within said first subset to produce bit rate that is

as large as possible but that is also less than or equal to the target bit rate; and

defining said optimum ~~constellation sizes~~ center frequency and constellation size in accordance with said noise margin.

17. (Currently Amended) The method according to claim 16 wherein the step of defining said optimum ~~constellation sizes~~ center frequency and constellation size in accordance with said noise margin comprises defining optimum ~~constellation sizes~~ center frequency and constellation size in accordance with largest minimum noise margin.

18. (Currently Amended) A method for enhancing a bit rate and/or margin at which communication is performed over multiple bands within a communication link, the method comprising the steps of:

defining a plurality of ~~spectral allocations~~ adjustable center frequencies for each band within said link, wherein each ~~spectral allocation~~ adjustable center frequency relates to a single QAM channel; and

defining an optimum combination of one of the defined ~~spectral allocations~~ adjustable center frequencies and a constellation size at which total bit rate and/or margin across said multiple bands is enhanced, wherein each constellation size relates to a single QAM channel.

19. (Currently Amended) The method according to claim 18 further comprising the steps of:

evaluating a response characteristic of said multiple bands with respect to said ~~plurality of spectral allocations~~ center frequencies;

determining a maximum constellation size for each of said ~~plurality of spectral allocations~~ center frequencies in accordance with said response characteristic; and

determining total bit rate delivered for each of said ~~plurality of spectral allocations~~ center frequencies and maximum constellation sizes~~; and~~, wherein said optimum combination of ~~spectral allocation~~ center frequency and constellation size is defined in accordance with said total bit rate.

20. (Currently Amended) A transceiver for bi-directional communication over a multi-band communication link, comprising

a transmit spectrum control circuit for varying ~~a spectral allocation~~ an adjustable center frequency with which encoding is performed on said multiple bands; and

a transmit constellation size control circuit for varying a constellation size with which encoding is performed on said multiple bands~~; and~~, wherein the transmit spectrum control and transmit constellation size control circuits cooperate to define a combination of ~~spectral allocation~~ center frequency and constellation size at which total bit rate and/or margin is enhanced over said multiple bands.

21. (Original) The transceiver as recited in claim 20, wherein the transmit spectrum control circuit is configured to sweep a symbol rate and center frequency of at least one of a

downstream channel and an upstream channel in a substantially continuous manner.

22. (Currently Amended) The transceiver as recited in claim 20, wherein the transmit spectrum control and transmit constellation size control circuits are configured to cooperate to simultaneously vary the constellation size ~~while maintaining a substantially constant spectral allocation~~ and the center frequency.

23. (Currently Amended) The transceiver as recited in claim 20, further comprising a receive spectrum control circuit for varying a ~~spectral allocation~~ an adjustable center frequency with which decoding is performed on said multiple bands.

24. (Original) The transceiver as recited in claim 20, further comprising a receive constellation size control circuit for varying a constellation size with which decoding is performed on said multiple bands.